



Productive performance of broiler chicks feed turmeric powder (curcuma longa)

Research project

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CHAPTER ONE

Introduction

Poultry scientists today are challenged to find out new alternatives to antibiotics as growth promoters with no side effects for poultry that could be more or as effective against harmful micro organisms in the gastrointestinal tract and to stimulate the growth by increasing efficiency of feed utilization and to enhance the immunity. There are a lot number of compounds and products in nature that have the potential of stimulating growth and combating various diseases by the virtue of being antibacterial, antifungal etc. Phytobiotics are the substances obtained from the medicinal plants and herbs have wide range medicinal properties and are possible alternatives to antibiotics as growth promoter (Khan et al., 2009). Subtherapeutic doses of antibiotics have been widely used as growth promoters in animal feed Improve animal growth performance and yield. In the presence of low levels of antibiotics, resistance The cells survive and grow, producing antibiotic-resistant populations in the final product. therefore, The EU has banned the use of antibiotics as growth promoters in animal feed Since January 2006. Due to the EU's ban and increasing pressure on livestock producers in other regions Alternative substances and strategies to promote animal growth and disease in some parts of the world Preventive measures are currently being studied, in which the use of plants and herbal products has increased Because they have gained more acceptance among consumers as natural additives, they have received attention. The beneficial effects of biologically active plant substances in animal nutrition may include stimulation Appetite and feeding, improve the secretion of endogenous digestive enzymes, activate Immune response and antibacterial, antiviral and antioxidant effects. Turmeric powder (Tp) is a medical plant that belongs to the ginger (Zingiberaceae) family and is a major source of phenolic compounds (curcuminoids). It is a perennial

plant with a short stem and large oblong leaves, and it bears ovate, pyriform or oblong rhizomes, which are often branched and brownish-yellow in color. Turmeric is the rhizome of *Curcuma longa* L. and is used as a food spice, and a preservative and coloring agent in China and South East Asia(Mishra et al., 2009). In recent years, traditional Indian medicine has been using turmeric powder for the treatment of biliary disorders, anorexia, coryza, cough, diabetic wounds, hepatic disorders, rheumatism and sinusitis (Mishra et al., 2009). Curcuminoids, such as curcumin, demethoxycurcumin and bisdemethoxycurcumin, are yellowish turmeric pigments and have antioxidative, anticarcinogenic, anti-inflammatory, antihepatotoxic and hypocholesterolemic activities (Nishiyama et al., 2005). In addition to the curcuminoids, compounds such as γ -terpinene, ascorbic acid, beta-carotene, betasitosterol, caffeic acid, campesterol, camphene, dehydrocurdione, eugenol, p-coumaric acid, protocatechuic acid, stigmasterol, syringic acid, turmerin, turmeronola, turmeronol-b and vanillic acid possess antioxidant capabilities (Duke, 2004). in this review report the use of turmeric powder (*curcuma longa*) as a diet supplement on productive performance in broiler chicks.

CHAPTER TWO

Litterateur Review

turmeric is used as a spice in many Asian countries, and almost 1 billion people throughout the world use it daily as a spice. Turmeric is an important component of traditional Chinese medicine and Indian Ayurvedic medicine. Turmeric's finger-like underground rhizomes are dried and used as a spice or taken as a powder in capsule form. Liquid extract of turmeric is also commercially available. Turmeric can also be used as paste for application on the skin. The most active component of turmeric is curcumin. Scientific research has shown that turmeric has antibacterial, antiviral, antifungal, antioxidant, and anticancer activities and also has a potential to reduce the risk of various malignant disease, arthritis, Alzheimer's disease, and other chronic illness including rheumatoid arthritis. Studies have shown that curcumin, the major phenolic compound present in turmeric, is particularly effective at reducing the risk of colon, skin, oral, and intestinal cancer and has excellent antioxidant and anti-inflammatory properties. Curcumin is very effective at scavenging peroxy radicals. Bhullar et al. showed that curcumin and many of its carbocyclic analogs have excellent free radical scavenging properties, but curcumin is probably the strongest antioxidant present in turmeric.

2.1Effect of turmeric powder on productive parameters

2.1.1-Effect on body weight gain (BWG)

Excess pounds do more than increase your weight—they increase your risk of major health problems. People who are overweight or obese are more likely to have heart disease, strokes, diabetes, cancer, and depression. Fortunately, losing weight can reduce your risk of developing some of these problems (Abd Al-jaleel 2011) Chicks were fed the following :- Diet (1)Using basal diet free from herbal plants kept as control , Diet (2) Basal diet + 0.25% of Curcuma longa (250 gm/100kg of feed) Diet (3) Basal diet + 0.50% of Curcuma longa (500 gm/100kg of feed).Diet (4) Basal diet + 1% Of Curcuma longa (1000 gm/100kg of feed).Diet (5) Basal diet plus 1.5 % of Curcuma longa (1500 gm/100kg of feed).

Table (1) revealed the effect of adding Turmeric to the diet on the performance of broiler chickens (body weight gain, feed intake, feed conversion) for a six weeks age. It had been found that the higher body weight gain was observed in birds fed diet contained Turmeric at level (T3) followed by birds in (T5,T4) respectively as compared with treats (T1 and T2), feed intake showed a higher increase in (T3) as compared with other treats, on the other hands ,feed conversion (T4) birds was the best as compared to control group (T1) and other treats group .,the improvement in body weight gain ,feed intake ,feed conversion traits.

Results revealed that the inclusion of turmeric at the levels of 0.50% in the diets improved body weight ,feed conversion ratio .

2.1.2-Effect on feed intake (FI)

Feed intake is key to developing diet specifications, attaining target growth rates and has a significant impact on efficiency of production. Surveys have shown that feed intake varies by at least 25 percent among commercial farms.(Abd Al-Jaleel 2011) found with used Diet (1)Using basal diet free from herbal plants kept as control , Diet (2) Basal diet + 0.25% of Curcuma longa (250 gm/100kg of feed) Diet (3) Basal diet + 0.50% of Curcuma longa (500 gm/100kg of feed).Diet (4) Basal diet + 1% Of Curcuma longa (1000 gm/100kg of feed).Diet (5) Basal diet plus 1.5 % of Curcuma longa (1500 gm/100kg of feed).Table (1) Results revealed that the inclusion of turmeric at the levels of 0.50% in the diets improved body weight ,feed conversion ratio ,there were a significant difference in feed consumption .

Table (1) Effect of Turmeric (Curcuma longa) on the performance of broilers \pm SE.

Weeks Treatments	6 weeks		
	Body weight gain (gm)	Feed intake (gm)	Feed conversion
Control T₁	2552 41.6 c	5359 52.4 a	2.1 1.2 a
0.25% T₂	2743 33.9 b	5376 47.5 a	1.96 1.9 a
0.50% T₃	3011 36.4 a	5389 49.7 a	1.79 1.7 b
1% T₄	2848 37.7 b	5154 51.8 a	1.81 1.6 b
1.5% T₅	2885 32.7 b	5019 58.6 a	1.74 1.7 b

Abc ,Means in the same column with no common superscript differ significantly , $P < 0.05$.

Abd Al-Jaleel (2011)

2.1.3-Effect on feed Conversion ratio (FCR)

It is dependent on many different factors which include and the level of feeding, which affects the maintenance requirements and the energy value of the ration and and the energy concentration of the body weight gains (cg). Chuoudhury et.al (2018) studied the effect of dietary supplementation of turmeric (*Curcuma longa*) powder on the performance of commercial broiler chicken. A total of 144 numbers of day-old commercial broiler chicks with uniform body weight were randomly divided into four groups viz. T0 (standard basal diet as control), T1 (basal diet + 0.25% turmeric powder), T2 (basal diet + 0.50% turmeric powder) and T3(basal diet + 0.75% turmeric powder) comprising 36 chicks in each group. Among the different experimental groups, the mean weekly feed conversion ratio (Table 2) of T1 group showed the best FCR values during the first (1.53) and second (1.42) week of age. On the third and fourth week, T3 group showed the best values (1.50 and 1.69) as compared to other groups. On the fifth week, the mean FCR value of T2 group (1.86) was best among all the experimental groups. In the sixth week of age, T1 group (1.85) showed best FCR followed be T3 (1.89), T2 (2.00) and T0 (2.18) group. The overall FCR of the entire period of experiment was best in T3 group (1.71) followed by T2 (1.75), T1 (1.81) and T0 (1.88) group.

Table 2: Mean weekly feed conversion ratio of broilers under different treatment groups

Week	Group			
	T0 (Control)	T1 (TP-0.25%)	T2 (TP-0.50%)	T3 (TP-0.75%)
1 st	1.71	1.53	1.81	1.75
2 nd	1.45	1.42	1.45	1.63
3 rd	1.82	1.8	1.6	1.5
4 th	1.83	1.74	1.78	1.69
5 th	2.13	2.33	1.86	1.88

6th	2.18	1.85	2	1.89
Overall	1.88	1.81	1.75	1.71

Chuoudhury et.al (2018)

2.1.4-Effect On Broiler Performance Efficiency Index and Livability :-

Chuoudhury et.al (2018) Among the different treatment groups, T3 group showed the highest BPEI (124.82) followed by T2 (117.09), T1 (108.50) and T0 (101.08) group (Table 6).

Table 3: Broiler Performance Efficiency Index (BPEI) and Livability of broilers under different treatment groups

Parameters	Groups			
	T ₀ (Control)	T ₁ (TP-0.25%)	T ₂ (TP-0.50%)	T ₃ (TP-0.75%)
BPEI	101.08	108.5	117.09	124.82
Livability (%)	100	100	100	100

Chuoudhury et.al (2018)

2.1.5-Effect on Mortality

(6)weeks of age ,results showed a reduced mortality percent of treated group as compared with control group ,this may be due to the action of active compounds in turmeric such as antioxidant ,antimicrobial, antimutagenic..... etc.) that keep birds in good health condition, moreover, results in table(4)

Table (4) Effect of turmeric (*Curcuma longa*) on mortality , of broiler \pm SE.

Measures Treatment	Mortality %
Control T₁	7.9\pm2.6 a
0.25% T₂	5.3\pm3.1 b
0.50% T₃	2.9\pm2.7 c
1% T₄	4.3\pm3.5 b
1.5% T₅	4.8\pm3.2 b

abc, Means in the same Colum with no common superscript differ significantly , $P < 0.05$

Abd Al-Jaleel (2011)

Conclusion

In this review reported that the use of turmeic powder (*curcuma longa*) as a diet supplement on productive performance for broiler chicks have found positive effects of turmeic on the performance and health, it can be concluded that the addition of turmeric powder in broiler diets improved body weight, feed coverision ratio and fed intake and reduced mortality.

References

- AL-Kassie, Galib AM, Akhil M. Mohseen, and Raghad A. Abd-AL-Jaleel. "Modification of productive performance and physiological aspects of broilers on the addition of a mixture of cumin and turmeric to the diet." *Research Opinions in Animal & Veterinary Sciences* (2011).
- Khan, Shahbaz, et al. "Pathways to reduce the environmental footprints of water and energy inputs in food production." *Food policy* 34.2 (2009): 141-149.
- Palmer, Margaret, et al. "Ecology for a crowded planet." *Science* 304.5675 (2004): 1251-1252.
- Shukla, Dali, et al. "Mouth dissolving tablets I: An overview of formulation technology." *Scientia Pharmaceutica* 77.2 (2009): 309-326.
- Tohge, Takayuki, et al. "Functional genomics by integrated analysis of metabolome and transcriptome of Arabidopsis plants over-expressing an MYB transcription factor." *The Plant Journal* 42.2 (2005): 218-235.
- Zachman, Michael J., et al. "Cryo-STEM mapping of solid–liquid interfaces and dendrites in lithium-metal batteries." *Nature* 560.7718 (2018): 345-349.